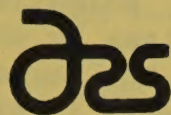


Notes

From the
Director



Agricultural
Research
Service

United States
Department of
Agriculture

Beltsville, Maryland

No. 166

February 1986

Budget and
Funding Update

As we enter 1986, I wish to update you on budget issues that will affect our programs over the next 2 years. We must reduce expenditures across the board in FY 86 to comply with the Gramm-Rudman-Hollings Legislation passed by the Congress. In the Beltsville Area, this means a cutback in spending of almost \$3.5 million. We plan to achieve this by restricting hiring, reducing travel, and delaying purchases wherever feasible.

On the plus side, the Beltsville Area did receive budget increases in FY 86 for specific programs. The FY 86 Budget approved by the Congress and signed by the President includes almost \$1.5 million of increases in the Beltsville Area for the following programs:

- o Improved technologies for resource inventories in soil and water conservation;
- o Groundwater quality management;
- o Germplasm evaluation and enhancement;
- o Animal health in support of action agencies;
- o Research support at the National Arboretum; and
- o Human nutrition research.

In addition, we recently received word from Dr. Kinney, ARS Administrator, that over \$1.5 million has been allocated to Beltsville for renovating and upgrading research laboratories in Building 006 for basic studies in plant molecular genetics. These renovations are scheduled to begin in July 1986.

Lets look ahead to FY 1987. The USDA Budget for FY 87 proposes a net increase of \$29 million for ARS. This represents a major vote of confidence in ARS since many Federal programs are scheduled for major budget reductions in FY 87. The President's Budget proposes a \$15.5 million increase for ARS to restore the Gramm-Rudman-Hollings FY 86 cuts and a \$13.5 million increase primarily to develop new uses (expand markets) for agricultural commodities and for plant germplasm research.

We appreciate your cooperation and support as we work together to tighten our belts in FY 86. I am optimistic that we will successfully negotiate our financial waters this year and come out stronger in FY 87.

Hormone of the Corn Earworm Isolated

Novel methods for controlling insects such as the corn earworm, Heliothis zea (a major pest of cotton and corn), may depend in the future upon developing a better understanding of the neurohormone regulatory system. Scientists are especially interested in the regulatory mechanisms by which insects use fats and sugars to produce energy. The hormones which regulate insect energy production occur in minute amounts in the neurosecretory cells of the nervous system.

Howard Jaffe, Livestock Insects Laboratory, and a number of collaborators recently isolated and determined the structure of one of these hormones. The material isolated from the corpora cardiaca of the corn earworm was shown to be a peptide and was tentatively named Heliothis adipokinetic hormone or H-AKH. This is the first neuropeptide to be structurally determined in any Heliothis species. Knowledge of the structure of H-AKH will make possible the synthesis of compounds with similar amino acid sequences and of other compounds which may be used to interfere with the action of the peptide, resulting in disruption of the life cycle and possibly death.

New Steroid Isolated

A new 21-carbon steroid (occurring as a glycoside conjugate containing three glucose units) has been isolated from ovaries and eggs of the tobacco hornworm, Manduca sexta, by a research team including M. J. Thompson, J. A. Svoboda, W. R. Lusby, J. E. Oliver, G. F. Weirich, and K. R. Wilzer of the Insect and Nematode Hormone Laboratory and H. H. Rees of the University of Liverpool, England. Radiolabeled steroid was formed from [¹⁴C] cholesterol following injection into female pupae. Although 21-carbon steroids having hormonal functions are common to vertebrates, the cleavage of the cholesterol side chain to form 21-carbon steroids is very unusual in insects. The relatively high concentrations of this new steroid conjugate in ovaries and eggs indicate a physiological role for this compound in Manduca, and this opens a new area of steroid biochemistry in insects. Although related 21-carbon steroids function as protectants for certain water beetles against predators, the function of this new steroid conjugate in Manduca remains to be determined. The goal of this research is to discover new pest control strategies based on selective disruption of the insect's hormonal control mechanisms.

Biological Control of Plant Diseases

Cucumber mosaic virus (CMV) is a widespread pathogen that infects numerous horticulturally important crops. It carries along a satellite named CMV-Associated RNA 5 or CARNA 5, which also multiplies in the host plant, but only when CMV infection has been established. There are many different naturally-occurring CMV satellites. These CARNA 5s alter CMV's disease symptoms in different ways, which must relate to the differences in their chemical structures or nucleotide sequences. Those CARNA 5s that reduce CMV disease have promise in biological control.

J. M. Kaper and C. W. Collmer, Microbiology and Plant Pathology Laboratory, recently cloned complete cDNA copies of two variants of CARNA 5 in the transcription vector pPM1. These two naturally-occurring CARNA 5s are capable and incapable, respectively, of inducing a lethal necrotic disease of tomato upon coinoculation with the genomic RNAs 1, 2, and 3 of cucumber mosaic virus. Uncapped transcripts synthesized in vitro from the two linearized, recombinant plasmids are infectious, and each induces the appropriate symptomatology upon coinfection with cucumber mosaic viral RNAs on tomato plants. Progeny CARNA 5s isolated from such infected plants correspond to their natural CARNA 5 counterparts.

This research has provided a tool to investigate the biological consequences of structural changes in these and several other CARNA 5 cDNA clones. This is needed to understand how to modify these clones to obtain CARNA 5 transcripts with optimal biological control capability. Such clones would be the starting materials in a biological control program aimed at reducing the losses and improving the quality of crops affected by CMV.

Rapid Test for Nematode Resistant Germplasm

Tissue culture and genetic engineering technologies are now being used to produce new peach lines by increasing the availability of new germplasm as well as by propagation of scion cultivars (generally used for grafting). Robin Huettel, Nematology Laboratory, and Freddi Hammerschlag, Tissue Culture and Plant Molecular Biology Laboratory, recently collaborated to study the resistance of peaches in vitro to nematodes. Their research established a procedure that can be used to select for tolerance and resistance in untested scion cultivars to plant parasitic nematodes in tissue culture. Using this new technique, lines resistant to nematodes can be identified in 5 weeks, compared with the several years required by traditional screening methods. This research will aid in the more rapid development of new peach breeding lines with potential resistance to nematodes.

Guayule Seeds Break Dormancy

Guayule is a plant native to the desert of southwest Texas and northern Mexico. It has been of interest since the first half of the century as a potential commercial source of natural rubber. A report from the National Academy of Sciences concluded that guayule has the potential to become important to the nation's economy and security, and a market for guayule rubber is assured if it can be sold at a competitive price.

One of the problems in commercializing guayule as a crop is the poor planting quality of the seeds. Direct seeding is unreliable due to low germination, poor seedling emergence, and subsequent mortality. Fresh seeds have a narrow temperature optimum ($17 \pm 2^\circ \text{C}$) in the dark and require light for maximum germination. G. R. Chandra, Plant Molecular Genetics Laboratory, has developed a chemical treatment using

polyethylene glycol and growth regulators to break dormancy and promote the onset of the germination process under conditions of acute osmotic stress. Unlike the nonconditioned seeds, conditioned seeds have a broader temperature optimum (15-30° C) for germination and do not require light for germination. Depending upon the seed lots used, the treatments enhance total germination, rate of germination, and percent of normal seedlings.

New Manual for Insect Taxonomists

Lloyd Knutson, Director, Biosystematics and Beneficial Insects Institute, (BBII) has announced the forthcoming release, in early 1986, of a major USDA publication, Identification Manual to United States Agromyzidae (Diptera), by Kenneth A. Spencer of Cornwall, England, and George C. Steyskal, Systematic Entomology Laboratory, BBII (retired).

Members of the fly family Agromyzidae mine in the leaves, stems, and seeds of a wide variety of plants, especially alfalfa and other high-value forage crops, damaging them and drastically reducing their yield. This illustrated manual provides a key for the identification of all 541 agromyzid species found in the United States, with descriptions of 85 new species and lists of host plants. It will be important to insect taxonomists and plant protection specialists throughout North America.

Care and Use of Animals in Research

On March 25, 1986, the Beltsville Area will offer training on ~~guidelines for using animals in research~~. This course is to assist scientific investigators, technicians, and animal caretakers in carrying out their responsibilities for the care and use of animals in research. Information will be provided on current laws, policies, and practices that affect the use of research animals. The principles and policies for animal use in the Beltsville Area will be reviewed. Information will be provided on techniques that are commonly used in an animal laboratory, and references are provided for those persons who want to acquire further training or direct assistance with specific procedures. The training will be from 8:00 a.m. to 12:30 p.m. in Building 003 Auditorium. Contact H. G. Purchase at 344-1664 for further information.

EEO Policy Statement for the Beltsville Area

It is my policy to provide equal employment opportunities to all employees of the Beltsville Area and to applicants for employment within the Area. I am requiring this same commitment of each manager and supervisory employee.

All employment decisions are to be on the basis of merit and made without regard to the individual's race, color, sex, age, religion, national origin, physical or mental condition. I am further requiring each manager and supervisor to take a more active role in searching out a wide spectrum of candidates for employment consideration.

We need to correct underrepresentation in our work force by hiring more American Indians, Alaskan Natives, Asian Americans, Pacific Islanders, Hispanics, and Black Americans.

Sexual harassment debilitates morale and interferes in the work productivity of its victims and other co-workers. Sexual harassment is deliberate or repeated unsolicited verbal comments, gestures, or physical contact of a sexual nature which are unwelcome. Sexual harassment is unacceptable conduct in the workplace and will not be tolerated in the Beltsville Area.

I encourage each manager's and supervisor's commitment to the provisions of this Statement.

Visiting Scientists

Theodor W. Ramp will be spending a year as a visiting scientist in the Helminthic Diseases Laboratory, with funding from the Swiss National Science Foundation. Dr. Ramp received a B.Sc. in Zoology from the Life Sciences Faculty at the University of Zurich specializing in the developmental biology of Drosophila, and did his Ph.D. at the Veterinary Faculty, University of Zurich, where he studied the energy metabolism of the filarial worm Litomosoides carinii. Before coming to Beltsville, he was head of the in vitro laboratory at the Institute of Parasitology in Zurich where his work included the study of alternative models to the use of laboratory animals, especially in vitro cultivation, maintenance, and parasite cryopreservation. Dr. Ramp will collaborate with Dr. Ray Gamble (HDL) on the biochemical and immunochemical characterization of antigens of the sheep parasite, Haemonchus contortus.

Yonging Jiang, The People's Republic of China, is a visiting scientist in the Hydrology Laboratory, ASRI. He arrived in September 1985 and will spend a year working with Dr. Jerry C. Richie on remote sensing of erosion and sedimentation. Mr. Jiang comes from the Northwestern Institute of Soil and Water Conservation, Academia Sinica, PRC.

Hospitality Extended to Wives of Foreign Scientists

Upon arriving in the United States, foreign visitors may experience some problems finding accommodations, furniture, transportation, child care, and such. In some instances, foreign visitors and their families may experience a change in life style (cultural shock) and want someone to talk with. In such situations, the support and advice from a group of people who have gone through the same experiences would be helpful.

Heidemarie Erdmann is taking the initiative to set up a new program for the wives of foreign scientists working at the USDA in Beltsville. Many of you may have heard of the International Women's Group set up by the wives of foreign scientists at the National Institutes of Health. Ms. Erdmann

would like to start a similar group for the USDA women. There will be friendly monthly meetings where you are welcome to attend and learn of other cultures. This program will provide a means for meeting different people. The first meeting is planned for the evening of March 4, 1986.

If you are interested, call Ms. Erdmann at 776-8674.

Ms. Erdmann's husband, Helmut, is a foreign visiting scientist in the Florist and Nursery Crops Laboratory at Beltsville. He can be reached at 344-3574.

Employee Activities

Robert M. Faust was invited to the Korean Advanced Institute of Science and Technology (KAIST), Seoul, Korea, in October 1985 to present two seminars titled "Biotechnology and High Technology" and "Microbial Insect Pathogens." Dr. Faust also developed a one year collaborative research program with the genetic engineering center at KAIST on the molecular biology of microbial insect pathogens.

Albert Rango, Research Leader, Hydrology Laboratory, ASRI, has been elected President of the American Water Resources Association (AWRA) for 1986. AWRA is dedicated to the advancement of water resources research, planning, development, management, and education through information exchange between all professionals in water related disciplines.

Ralph Lichtenfels, Research Leader, Biosystematic Parasitology Laboratory, API, has been elected President of the American Association for Zoological Nomenclature.

Patricia A. Pilitt, Biosystematic Parasitology Laboratory, API, has been elected Vice-President of the Helminthological Society of Washington for 1986. The 75-year old Society meets monthly in the Washington-Baltimore-Philadelphia area, and publishes a journal with an international circulation for which Ms. Pilitt serves as Assistant Editor.

E. Eric Grissell, Paul M. Marsh, Arnold S. Menke, Michael E. Schauff, and David R. Smith, Systematic Entomology Laboratory, BBII, will travel to the People's Republic of China (PRC) next May to participate in an International Symposium on the Identification of Parasitic Wasps Used in Biocontrol of Insect Pests. The Symposium-Training Course will be at the Institute of Biological Control, Department of Plant Protection, Fujian Agricultural College, Fuzhou, Fujian Province. Their visit will include field collecting and surveys for parasitic wasps and a large-scale sorting of the 100,000+ unidentified parasitic wasps in the collection at the Institute, in addition to the presentation of the symposium on the identification of major groups of parasitic wasps. These activities represent the first steps in a long-range objective

of an extensive survey in the PRC for natural enemies of insects and mites, and follows on a 2-year research visit of Dr. Chen Jia-Hua to the Systematic Entomology Laboratory.

Lloyd Knutson, Director, Biosystematics and Beneficial Insects Institute (BBII), and Robert D. Gordon, Research Entomologist, Systematic Entomology Laboratory (SEL), BBII, recently attended the 12th annual meeting of the Sociedad Colombiana de Entomologia (SOCOLEN) in Medellin, Colombia. At the meeting, the two entomologists presented invited papers on insect systematics research and services and accepted a special award honoring the taxonomists in the SEL for their extensive and long-term insect identification support to many institutions in Colombia. While in Colombia, Dr. Gordon also developed a specific program to prepare a comprehensive study of the Coccinellidae (ladybird beetles) of South America, similar to his recent monograph of Coccinellidae of North America.

**Agricultural
Research Center
Employees
Association**

Anyone who is interested in joining ARCEA and does not know the name of their Councilor should call the ARCEA office on 474-4777. Dues are \$2.00 and for this members get the BITS OF BARC (newsletter), deals flyers for many items such as cheese (twice a year), meat (twice a year), candy (both at Easter and Christmas), nuts, pecans, maple syrup, mums, bulbs, poinsettias, and pizza. The Association also sponsors functions during the year such as a picnic and Christmas program. All employees who work on the Center are welcome.

**Attention
Smokers**

Are you tired of being harassed by your spouse, begged by your children to quit smoking, frowned upon by co-workers when you puff smoke their way, feeling a little guilt when you read the article that tells you your life is being shortened by each cigarette you smoke? If so, this is for you.

An exciting, different type of quit smoking program is being offered this year. A "Smoking Cessation Workshop" is being sponsored by ARCEA and organized by the support group of:

Naomi Miller, EAP Coordinator
Sharon Jacobson, Director, ARS Fitness Center
Nancy Thrush, BARC-West Nurse

This 7-week course will run from March 6 to April 17 and will meet on Thursdays from 12 noon to 1:00 p.m. in the second floor conference room, Building 003. There will be a \$25.00 charge to cover cost of materials (a real bargain as the American Lung Association charge is \$200.00 up). The class will be limited to the first 25 persons responding. Call Nancy Thrush, 344-3024, to register.

**Cardio-Pulmonary
Resuscitation
Course**

CPR classes are available. The course consists of three 3-hour classes. Certification is good for 1 year. If you are interested in learning to save a life or need a CPR recertification, call Nancy Thrush - 344-3024.

Conference Room
Courtesy

The Visitor Unit (344-2403) is responsible for scheduling and managing the use of conference rooms at Beltsville. Your cooperation is needed to ensure that conference rooms are left neat and clean for the next group using the room. It can be embarrassing to take visitors into a conference room that was left disorderly by the previous users. Please take a few minutes after you finish a meeting to tidy up the room by removing used paper cups, excess paper and other litter. Your cooperation and assistance will be greatly appreciated.

Cash Awards

Elizabeth M. Agpaoa, Animal Caretaker, API, (For continuous outstanding performance as Animal Caretaker.)

Charlie McCall, Tractor Operator, Farm Management Branch, DO, (Outstanding performance of assigned duties in the Roads and Grounds Section of the Farm Management Branch.)

Sherry Lowe, Editorial Assistant, Family Economics Research Group, (Outstanding service as managing editor of Family Economics Review during a period of change in the editorial staff resulting in sustained quality and timeliness of the publication.)

Frank W. Douvres, Zoologist, Helminthic Diseases Laboratory, API, (For superior achievement in the development of a needed in vitro cultivation system that permits complete development of Ascaris suum, a major swine parasite.)

Catherine A. Guidry, Biological Laboratory Technician, Lipid Nutrition Laboratory, BHNRC, (For exemplary performance in the coordination of subject scheduling and organizing of sample collection from volunteers in the human study in addition to carrying out regular laboratory duties.)

Michael C. Butler, General Engineer, Engineering and Planning Branch, DO. (Superior performance as Acting Branch Chief, Engineering and Planning Branch, Division of Operations, for a continuous period of time and maintaining a high level of performance.)

JoAnn M. Whitt, Biological Laboratory Technician, Ruminant Nutrition Laboratory, ASI, (Exceptional support and dedication to two innovative research projects.)

Jane A. Wooster, Secretary, Tissue Culture and Molecular Biology Laboratory, PPHI, (For admirable secretarial performance to the Tissue Culture and Molecular Biology Laboratory during 2 1/2 years of leadership transition.)

Beatriz F. Engelke, Chemist, Weed Science Laboratory, AEQI, (For sustained, exceptional assistance in the development of analytical methods and precise analyses of samples in support of the Narcotic Plants Program.)

Marjorie B. Knowles, Biological Aid, Weed Science Laboratory, AEQI, (For exceptional originality in eliminating Colorado potato beetles from research field plots.)

Carey W. Spence, Agricultural Research Technician, Weed Science Laboratory, AEQI, (For exceptional support in laboratory, greenhouse, and field programs of the Weed Science Laboratory over extended periods.)

Dorothy H. Talmud, Secretary, Livestock Insects Laboratory, AEQI, (For outstanding secretarial support and extra effort in expediting the typing of new CRIS projects.)

Catherine A. McLean, Biological Laboratory Technician, Germplasm Introduction and Evaluation Laboratory, AEQI, (For assuming emergency duties of Clerk-Typist in the NSGC in addition to regularly assigned duties and performing them in a very timely and professional manner.)

Keith A. Hummel, Equipment Operator, Farm Management Branch, DO, (Outstanding performance of assigned duties in the Roads and Grounds Section of the Farm Management Branch.)

Ronald W. Kummerlowe, Pipefitter, Plumbing Shop, DO, (Outstanding work performance in the Plumbing and Pipefitting Shop of the Construction and Maintenance Branch, Division of Operations.)

James M. Moore, Pipefitter, Plumbing Shop, DO, (For outstanding work performance in the Plumbing and Pipefitting Shop, Construction and Maintenance Branch, Division of Operations.)

Audrey Carrell, Biological Laboratory Technician, BBII, (For outstanding contributions of a very diverse and beneficial nature to the Biosystematics and Beneficial Insects Institute while serving as Acting Systems Manager, May-October 1985.)

Paul E. Savoy, Jr., Pipefitter, Plumbing Shop, DO, (For outstanding work performance in the Plumbing and Pipefitting Shop, Construction and Maintenance Branch, Division of Operations.)

Andrew C. Whitehead, Automotive Mechanic, Farm Management Branch, DO, (Outstanding performance of assigned duties in the Research Plots Section of the Farm Management Branch.)

Katherine Marie Gott, Agricultural Research Technician, Florist and Nursery Crops Laboratory, HSI, (For sustained excellence in the superb conduct and performance of her research support responsibilities at a level beyond excellence with reliance, skill, dedication, and loyalty.)

Quality Within
Grade Increases

Ralph T. Roberts, Computer Specialist, Hydrology Laboratory, PPHI, (Outstanding performance in developing a micro computer program of SCS Technical Release 55 "Urban Hydrology for Small Watersheds.")

Patricia A. Adams, Secretary, Florist and Nursery Crops Laboratory, HSI, (For effectively performing secretarial duties and administrative support to the laboratory.)

Ingrid M. Fordham, Horticulturist, Fruit Laboratory, HSI, (For sustained superior performance of duties resulting in significantly greater productivity in the fruit tissue culture research program.)

Patricia A. Pilitt, Zoologist, Biosystematics Parasitology Laboratory, API, (For sustained dedicated service that increased the efficiency and productivity of the Biosystematic Parasitology Laboratory.)

Epilogue

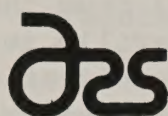
"The woodsman who stops often to sharpen his axe chops more wood" - Oliver Wendell Holmes

Waldemar Klassen

WALDEMAR KLASSEN
Director
Beltsville Area

Notes

From the
Director



Agricultural
Research
Service

United States
Department of
Agriculture

Beltsville, Maryland

No. 167

April 1986

Research
Instrumentation
for the 21st
Century

The XI Annual Beltsville Symposium in Agricultural Research will be held in the Auditorium of Building 003 from May 5-8, 1986. Dr. Terry B. Kinney, Jr., Administrator of ARS, will give the opening keynote address at the 8:30 a.m. session on Monday.

This symposium focuses on instrumentation for studying the biological and physical processes critical to the solution of today's agricultural problems. About 30 speakers will discuss emerging research tools that can open up new horizons for studies in the agricultural sciences, including such techniques as electro-magnetic spectroscopy, resonance and mass spectrometry, electron microscopy, isotope technology, separation techniques, microprocessors, and computer aided instrumentation.

A special award ceremony will be held at the close of the morning session on Monday to recognize a distinguished retired ARS scientist who has made outstanding contributions to science and to American agriculture.

Levander Receives
Nutrition Research
Award

Orville A. Levander, Research Chemist at the Beltsville Human Nutrition Research Center, was recently recognized by the American Nutrition Institute (ANI) for his outstanding contributions to basic research in nutrition. At the ANI annual meeting in April, Dr. Levander was given the Osborne and Mendel Award. The award consists of \$1,000 and an inscribed scroll.

Dr. Levander was cited for his excellent work in establishing procedures to measure the bioavailability of selenium. He discovered that platelet glutathione peroxidase was responsive to a depletion/repletion/depletion regimen in rats. By applying this knowledge to humans along with measurements of plasma and erythrocyte selenium concentrations, Dr. Levander examined the bioavailability of selenium in yeast and wheat compared to an inorganic source. All three sources were highly available by the platelet glutathione peroxidase assay, while the natural sources were superior to inorganic selenium in increasing plasma and erythrocyte selenium levels. Taken together, these findings indicate that there are different pools of selenium in the body and that all three measurements are required to accurately assess the bioavailability of selenium in foods.

Dr. Levander is a native of Illinois and received his undergraduate degree from Cornell University. He obtained his M.S. and Ph.D. (biochemistry) from the University of Wisconsin and joined ARS at Beltsville in 1969. Dr. Levander has over 80 scientific publications and recently was appointed to the Committee on Dietary Allowances of the Food and Nutrition Board of the National Academy of Sciences.

Genomic DNA Fingerprinting of Bacterial Strains

An apparently new form of citrus bacterial canker disease, caused by Xanthomonas campestris pv. citri, appeared in Florida in 1984 and has become the target of a major eradication campaign. Scientists in the Fruit Laboratory, HSI, recently reported on the use of "genomic DNA fingerprinting" to determine relationships among 43 strains of X. c. pv. citri isolated around the world and in Florida. When the genomic DNA of a bacterium is cut with a special enzyme, the resulting set of fragments can be visualized as a "genomic DNA fingerprint," which is unique for any strain of bacteria. By using this new technique, John Hartung and Ed Civerolo have demonstrated that the worldwide collection of X. c. pv. citri falls into three distinct groups which correlate well with region of origin and disease symptomology. The Florida strains do not form any such group but instead produce an extreme variety of genomic fingerprints. These results are inconsistent with the idea that either an existing or a new strain of X. c. pv. citri has been introduced into Florida. The results are consistent with the idea that the Florida strains are samples of an endemic flora which share the ability to attack a new citrus cultivar, from which most isolations have been made. The technique may be of interest to plant disease epidemiologists and to plant quarantine officials.

Aluminum Tolerance in Oat Cultivars

Oats are frequently grown in rotation with potatoes which require an acid soil (pH 5.4) to control the potato scab disease. However, oats are less tolerant to acid soils than potatoes and may be injured by Al toxicity at soil pH values near 5.0. Hence, there is a need for oat cultivars having a high degree of Al tolerance for use in such acid soil rotations. Aluminum tolerant cultivars would also be valuable where lime is not readily available or is prohibitively expensive, or where oats are grown on soils underlain by strongly acid subsoils.

Charles Foy, PPHI, Lee Briggie and Dave Smith, PGGI, recently collaborated in a study to evaluate the aluminum tolerance of 48 oat cultivars. Plants were grown in greenhouse pots of an unlimed Tatum subsoil at pH 4.3 and in limed Tatum soil at pH 5.7. They report that cultivars differed by nearly 3-fold in their tolerances to the acid soil. Relative top yields (pH 4.3/pH 5.7) ranged from 34.2 to 13.1% and relative root yields from 50 to 16.9%.

The acid soil-tolerant oat cultivars identified show promise for direct use in acid soil situations and as breeding materials in combining Al tolerance with other desirable traits in oats.

Host Alternation in Plant-Feeding Insects

Many species of aphids, adelgids, and phylloxerans are pests of field and forage crops and of forest, nut and/or ornamental plants. A full and comprehensive understanding of the life cycles of these pests is needed in order to identify correctly the species involved and to establish effective control measures. Manya Stoetzel, Research Entomologist in the Systematic Entomology Laboratory, BBII, reports that the recent discovery of host alternation in the Phylloxeridae has made it timely to present the expanded knowledge on host alternation as it occurs in the three families (Aphididae, Adelgidae, and Phylloxeridae) of aphids and their allies.

Host-alternating species spend the fall, winter, and spring on their primary or overwintering host which usually is a woody plant (tree or shrub). Aphids migrate to a secondary host which is usually a short-lived herbaceous plant where several generations are produced during the summer. The aphids migrate back to the primary host in the fall. Dr. Stoetzel recently prepared a paper which brings together our current knowledge on host alternation in these important, plant-feeding families of insects.

Basic Metabolism in Ruminant Livestock

Corn grain is a major cattle feed in the U.S., because it provides a concentrated source of energy (starch) for growth or milk production. The best use of corn starch depends on understanding how it is broken down during digestion and in what form it enters the bloodstream. Basic research in the Ruminant Nutrition Laboratory, ASI, is focused on defining the factors that regulate the absorption of nutrients and energy metabolism in livestock. Gerald Huntington and Paul Reynolds recently conducted three experiments to evaluate effects of abomasal infusion of glucose or starch on absorption of metabolites from portal-drained viscera of a nonlactating Holstein cow and two Hereford x Angus heifers. The major finding was that at most 1/3 of the corn starch given to the cows by a tube in the stomach entered the bloodstream as glucose, the building block of starch. This wasn't due to the inability to absorb glucose, because about 2/3 of glucose given by a tube into the stomach was absorbed as glucose. The significance of the research finding is that faster weight gain or milk production from feeding corn grain does not appear to be simply increased amounts of glucose in the bloodstream. More research is needed to first explain exactly what happens, and then develop a fuller understanding of the mechanisms involved.

DuPont Shows
Interest in
Insect Pathogens

Representatives of the Agricultural Chemicals Department of E. I. DuPont spent a day recently with scientists in the Insect Pathology Laboratory, PPI. They met with Robert Faust to discuss the status and possibilities of genetic engineering to increase the effectiveness and use of the bacterium Bacillus thuringiensis for the control of insect pests. They also conferred with Phyllis Martin and Russell Travers on the potential for exploiting the wide diversity of Bt strains found in the natural environment. The Insect Pathology Laboratory has a major effort underway to isolate and characterize viruses and other insect pathogens that can be used as agents for insect control.

Tomasek Joins
Pesticide
Degradation
Lab

Paul H. Tomasek has been appointed to an ARS Research Associate position as a Molecular Biologist in the Pesticide Degradation Laboratory, AEQI, working with Jeffrey S. Karns. Dr. Tomasek will be working on cloning the gene encoding carbofuran hydrolase, a new bacterial enzyme recently isolated and characterized in PDL. He received his B.S. degree in chemistry and biology at the University of North Dakota and his Ph.D. in microbiology at the University of Minnesota. Prior to coming to Beltsville, Dr. Tomasek spent 2 years as an NIH postdoctoral fellow in the laboratory of Dr. A.M. Chakrabarty, University of Illinois at Chicago.

Hodgson Reports
on Dairy
Research

Ralph E. Hodgson, former Director of the Animal Science Research Division in ARS, returned to Beltsville in April and gave a comprehensive report on the history of dairy production research. Dr. Hodgson spoke to a standing-room-only audience in the Conference Room of Building 200. On this occasion, Terry B. Kinney, Jr., Administrator of ARS, released a copy of a report prepared by Dr. Hodgson entitled, "Dairy Production Research by the United States Department of Agriculture, 1895 to 1980." This report (Misc. Pub. 1447) documents the organization and growth of research in dairy production in the USDA. Dr. Hodgson joined the USDA in 1930 as an animal husbandman, advanced to become Chief of the Dairy Research Branch, and ultimately Division Director. Over his career, he witnessed and had a profound influence on the scientific progress made by the dairy industry during the 20th century.

Acid Deposition
in the Tropics

Charles D. Foy of the Plant Stress Laboratory, PPHI, was an invited participant in an International Workshop on "Acidification in Tropical Countries," held at Caracas, Venezuela, in April. The conference was sponsored by SCOPE (Scientific Committee on Problems of the Environment). Discussions covered atmospheric, terrestrial, and aquatic phases of the acid deposition problem as well as corrosion effects on building

materials. The program consisted of invitational papers and discussions of case studies from Venezuela, Brazil, Australia, China, Bangladesh, India, Nigeria, and the Congo. Participants represented 15 countries. Proceedings of the conference will be published by John Wiley & Sons within 8-12 months. For details contact: Dr. Henning Rodhe, Chairman, Department of Meteorology, University of Stockholm, Arrhenius Laboratory, S-106 91 Stockholm, Sweden.

Friends of
Agricultural
Research

George Irving, former Administrator of ARS, chaired a meeting last October and launched a new organization known as the Friends of Agricultural Research-Beltsville. This initial meeting was convened as a result of a letter from Morton Beroza to a number of individuals interested in the research programs at Beltsville. The Agricultural Research Service has now signed a Memorandum of Understanding with this new Friends organization, agreeing to cooperate in activities that are of mutual benefit to both parties and to the public in general.

The Friends of Agricultural Research-Beltsville (a non-profit organization) has been incorporated for the purposes of supporting the research, educational, and public service activities of ARS at Beltsville. Russell Steere, recently retired from ARS, is the President and Jane Wall (retired, ARS) is Vice President. The address of the new Friends organization is P.O. Box 1061, Beltsville, Maryland.

EEO Advisory
Committee

In the last issue of these Notes, the EEO Policy for the Beltsville Area was outlined. The EEO Advisory Committee for the Beltsville Area is an important component of our overall EEO program. Committee members are selected to represent the diverse nature of the work force and include employees from all job categories; i.e., professional, technical, clerical, wage grade, and administrative. Members are located in each of the major organizational units in the Beltsville Area. The advisory committee can be a valuable channel for strengthening communications between managers, supervisors, and employees.

I encourage you to call upon any member of the EEO Advisory Committee if you have issues or concerns about the policies or programs affecting equal employment opportunity in the Beltsville Area. The members of the Committee are:

Alton Fleming, Chairman, PPHI
Margaret Johnson, EEO Manager
Olivia Broome, HSI
Gudrun Christenson, PGGI
Charlie McCall, DO
Twila Hoover, Animal Operations
Jitender Dubey, API
Marie Tousignant, PPI

Vallie Bray, FWP
Barbara Conrad, BAAO
Carol Davis, BHNRC
Elizabeth Anderson, AEQI
Paula Crowley, BBII
Joanne Whitt, ASI
Kathleen Scholl, FERG
James Ward, USNA

EEO Manager and
EAP Office Move
to East Side

Margaret Johnson, EEO Manager for the Beltsville Area, has moved from Building 003 to Building 307 on the East side of the Center. Ms. Johnson is now located on the first floor of Building 307, Room 100. Her telephone number is 344-3507.

The Employee Assistance Program staff also moved to Building 307. They are also on the first floor and can be reached by calling 344-3273.

Both of these offices will continue to provide the high level of service to which you are accustomed. You are encouraged to stop in and visit the professional staff whenever advice or assistance is desired.

Wives of Foreign
Scientists Meet

In the last Notes we mentioned a new program for wives of visiting foreign scientists. After the initial March meeting of the group, it was decided that there is indeed a need for this kind of meeting. An itinerary has been organized for the next 3 months, and you are invited to attend.

May 20 - 8:00 p.m. - This meeting will consist of shopping and sightseeing information around Beltsville and the surrounding areas.

June 22 - Excitement galore! A BBQ at the picnic area at the USDA. All are welcome, bring your family and friends and meet your fellow USDAers. Everyone should provide their own meal.

July 15 - Another planning meeting - ideas on a cultural evening would be appreciated.

For more information call Elisabeth on 937-7517 or Heidi on 776-8647. We are looking forward to seeing you.

Cash Awards

Ruth A. McConnell, Fiscal Assistant, BAAO - For an exceptionally high level of sustained superior performance in the budget section of the Beltsville Area Administrative Office.

Janice S. Collins, Biological Laboratory Technician, and Joan M. Conway, Research Chemist, Energy & Protein Nutrition Laboratory, BHNRC - For outstanding service to the Agency by setting up an exhibit and demonstrating a new approach for estimating body composition at the Food and Fitness Conference.

Wayne C. Marcus, Computer Programmer, BHNRC - For superior service in researching needs and sources of instrumentation and equipment for the human calorimeter and for outstanding continuing contributions in the acquisition of this instrumentation.

Faye T. Hawkins, Secretary, USNA - For outstanding personal efforts to maintain the flow of administrative activities during a period of reduced staff members.

Nancy V. Rinker, Secretary, Animal Operations - For dedicated, outstanding secretarial and administrative support to the Animal Operations Unit.

Bonnie E. Morgan, Statistical Assistant, Nonruminant Animal Nutrition Laboratory, ASI - For efficiently processing and organizing swine breeding research data for use in statistical analyses and annual reports.

Cissel L. Archer, Utilities Systems Operator, DO - For superior performance as General Foreman of the Utilities Section and performing additional duties due to section vacancies.

Charles H. Randolph, Jr., Guard Supervisor, DO - For superior performance as Guard Supervisor during a period of reduced number of personnel.

John W. Moton, Russell R. Ridley, Joseph L. Marshall, Leonard G. Matthews, Boiler Plant Equipment Mechanics, and Albert Whitehead, Utility Systems Repairer Operator, DO - For exemplary performance above their regular duties in the replacement of underground steam and return mains in four areas that supply steam to buildings used for research.

Charles C. Welch, Jr., Welder, Sheet Metal Shop, DO - For outstanding work performance in the Sheet Metal Shop, Maintenance and Construction Branch, Division of Operations.

Bradford W. Berry, Research Food Technologist, Meat Science Research Laboratory, ASI - For outstanding responsiveness through research which allowed the Agricultural Marketing Service to eliminate the use of USDA Purchase Specifications for ground beef resulting in an annual savings of 20 million dollars.

Florence Cox, Program Service Assistant, Germplasm Quality & Enhancement Laboratory, PGGI - Sustained superior performance as program assistant for the U.S. coordination of OECD seed schemes and the National Foundation Seed Report, 1980-1985.

Lydia R. Poole, Clerk-Typist, Germplasm Quality & Enhancement Laboratory, PGGI - Outstanding performance on temporary assignment as Laboratory Secretary, Field Crops Laboratory.

Daniel S. Pazdersky, Biological Aid, Weed Science Laboratory, AEQI - For exceptional display of responsibility in development of technique permitting mechanical harvesting of research plots.

Olivia C. Broome, Horticulturist, Fruit Laboratory, HSI - For outstanding performance in coordinating details for the Conference on Tissue Culture as a Plant Production System for Horticultural Crops, held at Beltsville, October 20-23, 1986.

Peter M. Mazzeo, Botanist, USNA - For outstanding personal efforts to maintain the programs and facilities of the Herbarium of the U.S. National Arboretum during a period of reduced staff members.

Lawrence A. Henson, Biological Laboratory Technician, Helminthic Diseases Laboratory, API - For superior service in the initiation and conduct of vaccine trials for swine trichinosis.

Jean B. Blythe, Biological Laboratory Technician, Helminthic Diseases Laboratory, API - For superior service in the establishment of high priority project on swine trichinosis epidemiology.

Georgia L. Smith, Accounting Technician, PPI - For sustained, superior performance in carrying out all aspects of her accounting duties and in providing accounting support for all laboratories in the Plant Protection Institute.

Dawn J. Harrison, Physical Science Technician, Insect & Nematode Hormone Laboratory, PPI - For sustained superior performance in the collection of biological samples and operation of mass spectrometer.

Rhoda E. Barnes, Biological Laboratory Technician, Energy & Protein Nutrition Laboratory, BHNRC - For outstanding skill, effort and initiative in maintaining a nitrogen analyzer and for excellent execution of assignments.

Bernice H. Brooks, Biological Laboratory Technician, Energy & Protein Nutrition Laboratory, BHNRC - For sustained superior performance in operating and maintaining laboratory equipment and for maintaining high standards in analytical results.

Quality Within
Grade Increases

Beulah C. Lubis, Secretary, Germplasm Introduction & Evaluation Laboratory, PGGI - For an exceptionally high level of sustained performance as Secretary, Plant Exploration & Taxonomy Laboratory.

Mary McDonough, Fiscal Assistant, BAAO - For sustained excellence in the performance of her responsibilities at an exceptionally high level with reliance, skill, dedication, and loyalty.

Robert C. Staples, Chemist, Energy & Protein Nutrition Laboratory, BHNRC - For outstanding sustained performance in assuming responsibilities associated with the operation and maintenance of an automated, high pressure amino acid analyzer including the analyses of samples from a wide variety of sources, tabulations of data, and interpretation of results.

Linda M. Neuenhahn, Secretary, Reproduction Laboratory, ASI - For outstanding performance of duties as Secretary of the Reproduction Laboratory.

Anne M. Powell, Biological Laboratory Technician, Reproduction Laboratory, ASI - For outstanding effort contributing to the creation of transgenic sheep.

James P. Flook, Biologist, Reproduction Laboratory, ASI - For sustained outstanding work performance in mastering the operation of a flow cytometer in a short time and conducting analyses of sperm and other cell types with superb efficiency.

Stephen D. Hight, Entomologist, Beneficial Insect Laboratory, BBII - For personal initiative and competent performance of duties, both administrative and research, that maintained and advanced a viable and effective research program for the biological control of weeds during the prolonged absence of a designated supervisory scientist.

Epilogue

A man may have a great truth; he may make a great discovery; he may produce a great product; and yet die without anybody being benefited by it if he doesn't share it, if he doesn't find a way to tell it.

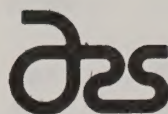
-----Richard Evans

Waldemar Klassen

WALDEMAR KLASSEN
Director
Beltsville Area

Notes

**From the
Director**



**Agricultural
Research
Service**

**United States
Department of
Agriculture**

Beltsville, Maryland

No. 168

June 1986

**Kinney
Inaugurates ARS
Scientific Hall
of Fame**

At the XI Annual Beltsville Symposium in Agricultural Research, Terry B. Kinney, Jr., Administrator of ARS, announced that an ARS Hall of Fame was being established to recognize "highly successful scientists whose careers exemplify a deep commitment to public service through agricultural research." The individuals to be selected annually will serve as role models for aspiring scientists in agricultural research.

Edward F. Knipling, who conducted or directed entomological research within ARS from 1930 to 1974, is the first ARS scientist to be inducted into the ARS Hall of Fame. Dr. Knipling continues to work at Beltsville as an ARS collaborator. Congressman Steny Hoyer of Maryland presented the Hall of Fame Award to Dr. Knipling on the morning of the first day of Symposium XI.

Dr. Knipling is best known for his role in developing the use of sexual sterility to control or eradicate insect pests. Under Dr. Knipling's guidance, gamma rays were used to induce dominant lethal mutations in the germ cells of the screwworm flies. Billions of irradiated flies were distributed over vast areas to totally eliminate the screwworm from the United States and from most of Mexico. The screwworm infests wounds and is a major cause of mortality in livestock, wildlife, and occasionally in man.

However, Dr. Knipling's greatest contribution was his leadership in advancing to an unprecedented extent the science and technology of insect control. During the 17 years when Dr. Knipling was in charge of most entomological research in ARS, he shifted resources to develop ecologically selective and environmentally safe methods and systems of insect control. Dr. Knipling established the Insect Pathology Laboratory and the Insect and Nematode Hormone Laboratory at Beltsville. Presidents Truman, Johnson, and Nixon each awarded the National Medal of Science or its equivalent to Dr. Knipling. Dr. Knipling is a member of the National Academy of Sciences.

Norris and
Zimmerman
Receive Honor
Awards

At the USDA Honor Awards Program on June 4, Secretary Lyng presented awards to two ARS researchers in the Beltsville Area.

Karl H. Norris, RL, Instrumentation Research Laboratory, SCSL, received the Distinguished Service Award for developing principles and instruments for rapid non-destructive measurement of the quality of agricultural products. Norris, a member of the National Academy of Engineering, received the USDA Superior Service Award in 1963.

Richard H. Zimmerman, Research Plant Physiologist, Fruit Laboratory, HSI, was cited by Secretary Lyng for his innovative research in developing tissue culture propagation techniques for fruit producing plants. Dr. Zimmerman was one of five ARS scientists who received the Superior Service Award in 1986 for scientific research.

Ground Broken
for Arboretum
Acropolis

Twenty-four sandstone historic columns from the old East Front of the U.S. Capitol will be placed in a classical setting on the grounds of the U.S. National Arboretum within the near future. Plans were unveiled for this project at a special ceremony at the Arboretum on May 13. Vice-President George Bush and USDA Secretary Richard Lyng broke ground for this project on a grassy meadow of the Arboretum grounds. The design for the setting of the columns includes a garden, fountain, and a shallow reflecting pool replenished by a stream of water flowing from the fountain amidst the columns.

The Friends of the National Arboretum raised the funds necessary to develop this National Capitol Columns Garden. When completed, this Garden will serve as an attractive setting for many outdoor events at the Arboretum.

New Director
for HSI

Miklos Faust has succeeded A. A. Piringer as Director of the Horticultural Science Institute. Dr. Piringer retired on June 3.

Dr. Faust is an international authority in horticulture. He is well known for his contributions in the physiology of color development in apples, the role of calcium in maintaining fruit quality, and basic factors affecting tree growth and development, including genetic mechanisms associated with dwarfing of fruit trees. Dr. Faust joined ARS at Beltsville in 1966 after getting a B.S. at the Agricultural University at Budapest, an M.S. at Rutgers, and a Ph.D. from Cornell University. He is a Fellow and Vice-President of the American Society of Horticultural Science (ASHS) and a recipient of the ASHS Gourley Award. The ASHS also dedicated the fifth volume of Horticultural Reviews to Dr. Faust in recognition of his outstanding contributions to horticultural science.

Civerolo Accepts New Role in Fruit Laboratory

Edwin L. Civerolo has been designated as the Research Leader of the Fruit Laboratory, HSI, replacing Miklos Faust, who assumed new responsibilities as Institute Director, HSI.

Dr. Civerolo received his B.S. and Ph.D. degrees from the University of California, Riverside. He came to Beltsville in 1967 as a Research Plant Pathologist. He is widely recognized for his innovative research on the role and use of phages in the development and control of plant diseases caused by phytopathogenic bacteria. He received a USDA Superior Service Award in 1985 for his service in identifying the cause of citrus canker disease in Florida and for providing the scientific research needed to support regulatory actions. Dr. Civerolo's research findings have been documented in some 50 scientific publications.

Ruminant Nutrition Has New RL

Theron Rumsey has accepted the position as Research Leader of the Ruminant Nutrition Laboratory in the Animal Science Institute. Paul Moe, who served as RL since 1978, has taken on new responsibilities as RL in the Energy and Protein Nutrition Laboratory in the Beltsville Human Nutrition Research Center.

Dr. Rumsey came to Beltsville in 1965. His B.S., M.S., and Ph.D. degrees are from Purdue University. Dr. Rumsey is well known for his research on the fate and physiological effects of agricultural chemicals in beef cattle. His more recent research has concentrated on the control of metabolism and composition of tissue growth in cattle and sheep. He is the author of some 170 articles, including over 100 in scientific journals.

Science Advisor to the Director

Lekh R. Batra, Research Microbiologist, Plant Protection Institute, has been appointed as Science Advisor (microbiology) to the Director, Beltsville Area. In this role, Dr. Batra will identify nationally significant topics and trends in science and provide advice on the management of our scientific resources for meeting national needs in agriculture.

Dr. Batra is a native of the Indus Valley, Punjab. He immigrated to the United States in 1955 and earned a Ph.D. in plant pathology from Cornell University in 1958. Dr. Batra served on the faculty of a number of universities before joining ARS in 1967. He is an internationally recognized authority in the field of mycology and is especially noted for his research on the systematics and ecology of fungi (cup-fungi, yeasts, and smuts), insect-fungus mutualism, and other aspects of entomology and plant pathology. Dr. Batra has over 100 publications. He is active in many scientific organizations, including membership on the Board of Trustees of the American Type

Culture Collection, Executive Committee of the International Mycological Association, and U.S. Delegate to the General Assembly of the International Union of Microbiological Societies.

Elgin Moves to NPS

T. J. Army, Deputy Administrator, National Program Staff, (who also received a USDA Superior Service Award) announced on June 17 that he has selected James H. Elgin to join the National Program Staff. Dr. Elgin will provide national leadership for the ARS programs on forage and pasture research. Since 1980, Dr. Elgin has served as Research Leader of the Field Crops Laboratory and, more recently, the Germplasm Quality and Enhancement Laboratory, PGGI. He is trained as a geneticist and has conducted extensive research on the development of alfalfas with combined resistance to diseases, insects, nematodes, and mineral imbalances in soils.

Nitrogen Fixation in Soybeans

A major research thrust on nitrogen fixation is the development and application of genetic engineering and other techniques for the creation of rhizobial strains with enhanced ability to fix nitrogen. Genetically engineered strains may soon be available and, indeed, highly effective naturally occurring strains already exist. However, establishing these strains in a significant proportion of the nodules formed by a field-grown legume has been, and remains, a critical problem. Faced with competition from indigenous Rhizobium populations, such highly efficient nitrogen fixing strains form few nodules and therefore have a minimal effect upon N_2 fixation.

A recent research report from the Nitrogen Fixation and Soybean Genetics Laboratory, PPHI, describes a unique symbiotic system whereby the soybean host plant favors nodulation by improved Rhizobium strains and restricts nodulation by strains of the predominant indigenous competitors (serogroup USDA 123) found in more than half of the U.S. soybean production areas. Perry Cregan and Harold Keyser screened 1,278 soybean plant introductions and identified a group of 13 soybean genotypes which appear to preferentially nodulate with highly effective rhizobia rather than less effective strains of serogroup USDA 123. These soybeans appear to be genetically distinct from soybeans currently grown in the U.S. and offer the hope of more efficient N_2 fixation.

Computer Analysis of Bacterial Polypeptide Patterns

Bacterial soft rot of horticultural crops causes severe economic losses to producers, marketing outlets, and consumers. Identification of the bacteria causing the decays has been very difficult, often resulting in misdiagnoses and improper control practices. Harold E. Moline, Horticultural Crops Quality Laboratory, HSI, and William R. Hruschka, Instrumentation Research Laboratory, SCSI, recently reported on a potential technique that will promote the accurate identification of this group of post-harvest pathogens. The technique is based on an analysis

of proteins of the bacteria on gels. The sensitivity of the gel technique was increased by using a minicomputer. Six bacterial species from the genus Erwinia, which contains most of the postharvest soft-rotting bacteria were compared using this technique. Previously, gel comparisons had been difficult and time-consuming, as 200-400 proteins had to be visually matched on gels. Use of the computer has made comparisons much more rapid and facilitated the creation of a reference library of relevant protein profiles for future taxonomic comparisons. The method, called two-dimensional polyacrylamide gel electrophoresis (2-D PAGE), has the potential for simplifying the identification of postharvest bacterial pathogens.

Agromyzid Flies of the U.S.

Agromyzid flies are serious pests in U.S. agriculture. There are over 150 species in the world that damage cultivated plants. A few are serious pests as stem feeders, but the majority are leaf miners. Crops affected in the U.S. include lettuce, celery, peas, chrysanthemums, ornamentals, alfalfa, cereals, etc. The identity of many species has been difficult or impossible to ascertain.

To address this problem, G. C. Steyskal, Systematic Entomology Laboratory, BBII, and K. A. Spencer, University of Exeter, England, conducted cooperative research and published a 478-page USDA Agricultural Handbook (No. 638) entitled, "Manual of the Agromyzidae of the United States." The publication treats 531 species in the United States including 85 new to science and 43 previously unknown in the area. It includes detailed identification keys, a synopsis and description of each species, and an index to the agromyzid host and feeding habits. The volume contains 1,372 figures including diagnostic morphological characters and illustrations of plant damage. This research publication will allow economic entomologists, extension personnel, biological control specialists, ecologists, and others to accurately identify agromyzid flies of the United States without the aid of a specialist or reference to a large collection.

Postdoc Studies Rhizobium Bacteroids

Peter R. Beckjord has a temporary appointment in the Nitrogen Fixation and Soybean Genetics Laboratory, PPHI, working with Donald L. Keister. Dr. Beckjord is working on the isolation and purification of cytochrome P₄₅₀ from Rhizobium bacteroids. He received his B.S. and M.S. at West Virginia University and his Ph.D. in forestry (emphasizing mycorrhizal symbiosis) at Virginia Polytechnic Institute and State University. His past research experience includes studies of nitrogen influences in ectomycorrhizal formation of oaks, hickory, and pine seedlings and also the ecological association of ectomycorrhizal basidiomycetes in angiosperm and gymnosperm forests in western Maryland.

Theme for 1987
Symposium in
Agricultural
Research

The Twelfth Annual Beltsville Symposium in Agricultural Research will be held on May 3-7, 1987. The theme will be "Biomechanisms Regulating Growth and Development: Keys to Progress." Theron Rumsey, ASI, and George Steffens, HSI, will co-chair the organizing committee for next year's symposium. Copies of the outline of the tentative program sessions may be obtained by calling 344-4643. The symposium will be co-sponsored by the Friends of Agricultural Research-Beltsville, Inc. (FAR-B).

Cash Awards

Beverly J. Colvin, Secretary, Plant Molecular Genetics Laboratory, PGGI - For outstanding performance of secretarial duties for the Plant Molecular and Genetics and Seed Research Laboratories during a critical period.

Samuel Garrett, Agricultural Research Technician, Tissue Culture and Molecular Biology Laboratory, PPHI - For assisting his supervisor and the research staff with the disposition of laboratory equipment, records, etc., following the dissolution of the Tobacco Laboratory.

Ann Gray, Biological Laboratory Technician, Plant Molecular Genetics Laboratory, PGGI - For assisting the research laboratory with the disposition of laboratory equipment, records, etc., following the dissolution of the Tobacco Laboratory.

Robert J. Wall, Research Physiologist, Reproduction Laboratory, ASI - For outstanding performance in justifying, planning, and designing a mouse housing facility.

H. Graham Purchase, Special Scientific Advisor, BA, DO - For superior performance as a Special Scientific Advisor to the Beltsville Director.

Marilyn A. Low, Clerk-Typist, Nonruminant Animal Nutrition Laboratory, ASI - For exceptionally high quality preparation of scientific abstracts and regional committee reports.

Parthasarathy Pillai, Chemist, Weed Science Laboratory, AEQI - For outstanding research support leading to the discovery of a new crop protection chemical and scientific principle.

Quality Increase

Gudrun M. Christenson, Botanist, Germplasm Introduction and Evaluation Laboratory, PGGI - For an exceptionally high level of sustained performance as Support Scientist, Plant Exploration and Taxonomy Laboratory and (since November 10, 1985) Germplasm Introduction and Evaluation Laboratory.

Judy L. duCellier, Economic Botany Program Assistant, Germplasm Introduction and Evaluation Laboratory, PGGI - For an exceptionally high level of sustained performance as Economic Botany Program Assistant, Germplasm Resources Laboratory and (since November 10, 1985) Germplasm Introduction and Evaluation Laboratory.

Nadine E. Hiers, Secretary, Plant Genetics and Germplasm Institute Office - For sustained outstanding performance of clerical, office management and administrative support responsibilities while serving as Secretary for the Plant Genetics and Germplasm Institute.

Judy A. Adams, Secretary, Meat Science Research Laboratory, ASI - For sustained superior performance as a secretary-typist in providing administrative and secretarial support to the Meat Science Research Laboratory which aided in the achievements of the Laboratory.

Leigh M. Walton, Computer Programmer Analyst, Animal Improvement Programs Laboratory, ASI - For sustained superior performance as leader of the computer operations section in developing innovative computerized procedures that led to increased efficiency with fewer staff positions.

Epilogue

Each man can interpret another's experience only by his own.

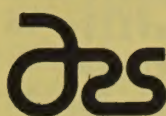
-----Henry David Thoreau

Waldemar Klassen

WALDEMAR KLASSEN
Director
Beltsville Area

Notes

From the Director



Agricultural
Research
Service

United States
Department of
Agriculture

Beltsville, Maryland

169

August 1986

Distinguished Scientist Award to Kearney

Terry B. Kinney, Jr., Administrator of ARS, has announced that Phillip C. Kearney, Research Leader, Pesticide Degradation Laboratory, AEQI, has been selected as the ARS Distinguished Scientist of the Year. Dr. Kearney was selected from among 11 nominees in ARS. He is being recognized for his innovative leadership and creative research on chemical and biological methods for the destruction of pesticide wastes to reduce hazards of groundwater pollution by agricultural chemicals.

Kearney, a Ph.D. graduate of Cornell, joined ARS at Beltsville in 1962 as a Research Biochemist. He has published over 200 research papers, abstracts, chapters, or reviews dealing with the distribution and degradation of pesticides and toxic substances in the environment. He recently organized a new biotechnology team within the Pesticide Degradation Laboratory to explore the potential of microbiological methods for pesticide disposal. Kearney is the past Chairman of the Pesticide Chemistry Division, American Chemical Society (ACS), and in 1981 he received the International Award for Research in Pesticide Chemistry from the ACS. He also was honored in 1983 by the International Union of Pure and Applied Chemistry for his distinguished service in advancing pesticide chemistry.

As the ARS Distinguished Scientist of the Year, Kearney will receive a \$5,000 cash award and \$40,000 in FY 87 to support his research program.

Turkey Industry Cites Sexton

Thomas Sexton, Research Leader, Avian Physiology Laboratory, ASI, was given the National Turkey Federation Award on August 7, 1986. The award was presented at the Poultry Science Association meeting in Raleigh, North Carolina, and consists of \$1,000 and an engraved plaque.

Dr. Sexton is recognized nationally as an authority on semen preservation, semen extenders, sperm metabolism, and artificial insemination in poultry. He has developed special techniques that successfully preserve the fertilizing capacity of chicken and turkey semen at temperatures above freezing. This technology has had a major impact on the turkey industry by reducing labor costs and decreasing the number of toms required for breeding.

Sexton received his Ph.D. from Pennsylvania State University and joined ARS at Beltsville in 1971. He has a number of other awards for his research including the USDA Superior Service Award and the Poultry Science Association Research Award in 1982. Dr. Sexton has authored more than 100 research publications.

Brain Hormones of the Gypsy Moth

Extensive destruction of forest and residential trees by gypsy moth larvae continues to be a problem. The serious damage done by this noxious pest is costly, both economically and ecologically, and is spreading from the northeastern United States. New approaches to the control of the moth are needed.

Edward P. Masler and colleagues in the Insect Reproduction Laboratory, AEQI, have initiated a project to isolate and identify the brain hormones necessary for the reproduction and development of the gypsy moth. A bioassay has been developed to detect brain hormones, and two different molecular forms have been discovered. Isolation of these hormones is an important step which can lead to novel agents for insect control, isolation of the genes producing the hormones, and the production of anti-hormones using recombinant DNA technology.

New Assay for Virus of Small Grains

Barley yellow dwarf is considered by many to be the number one disease of small grains throughout the world. Infected plants have depressed yield and produce poor quality grain. The plant viruses that cause this widespread disease are responsible for economic losses in the millions of dollars each year. One way to reduce losses is to breed virus-tolerant varieties. This breeding work is difficult because the virus is spread in the field only by aphid vectors as they feed on plants, and especially because a group of different viruses all cause the same disease.

Identification of the various viruses that cause the disease has been the major focus of a cooperative research effort involving ARS scientists, including H. T. Hsu, Florist and Nursery Crops Laboratory, HSI, and collaborators at Idaho and Cornell Universities. A recent paper from this collaborative effort describes a new way (a modified, indirect enzyme-linked immunosorbent assay) to assay one of the five major viruses that cause the disease. Specificity and reliability of the method was shown during 15 months in tests of both clarified and purified preparations of the five viruses and of samples of grains and grasses from the field. The comparative assay was especially useful in a study of five SGV-like viruses from Idaho that had a range of biological properties.

Movement of
Pesticides in
No-till Soils

The movement and fate of pesticides in the environment continue to be an area of critical interest to the public. The use of classical theories of fluid dynamics has certain limitations when they are used to describe or predict the movement of pesticides under agricultural conditions.

Timothy J. Gish, Hydrology Laboratory, ASRI, and other ARS scientists at Beltsville are developing an alternative approach that combines both statistical concepts and classical physics. Working with colleagues in the Pesticide Degradation Laboratory and the Weed Science Laboratory, AEQI, Dr. Gish is evaluating not only the movement of atrazine but the processes governing its movement. Results indicate that on a no-till field pesticides may move more rapidly than had been predicted, the rapid movement being due to rapid flow in large soil pores, root channels, and soil cracks. Additionally, research results indicate that a small portion of the atrazine may be chemically altered, allowing it to move freely with the soil solution. The time transformation used to describe transient water inputs in the model will be of benefit to private as well as Government agencies interested in estimating contaminant transport to groundwater.

Maintaining Fruit
Quality in Storage

Scientists in the Horticultural Crops Quality Laboratory, HSI, are continuing to seek ways to extend the storage life of fresh fruits and vegetables. C. Y. Wang (and G. L. Steffens, Fruit Laboratory, HSI) recently evaluated the postharvest behavior of fruit from apple trees treated with a new growth inhibitor, paclobutrazol. They found that fruit from 'Spartan' apple trees treated with paclobutrazol retained greater firmness and had less internal breakdown than control fruits after 7 months of storage at 0 degrees C. However, other ripening parameters were not significantly affected. Preharvest treatment with paclobutrazol therefore was beneficial in maintaining storage quality of apples and not detrimental to the postharvest ripening capacity. Information on postharvest effect of the chemical as reported in this study will aid in the registration of this new and useful bioregulator.

Test for Swine
Parasite Licensed
to Private Firm

Scientists in the Helminthic Diseases Laboratory, API, have developed an effective enzyme-linked immunosorbent assay (ELISA) procedure for detecting trichinosis in swine. Even though the national prevalence of trichinosis is low (1 pig in 1,000), a reliable ELISA test is very important for epizootiologic investigations aimed at identifying infected herds and monitoring the progress of efforts to eradicate the parasite from the herd.

The new Trichinella spiralis antibody test has been licensed by USDA to IDETEK, Inc., of San Bruno, California. Research leading up to the commercialization of this new procedure was conducted under a Memorandum of Understanding between ARS and IDETEK.

Students Reap Research Rewards

Graduate students in apiculture are benefiting from a significant ARS research development from Beltsville. In the late 1970's, a team of ARS scientists at Beltsville (under the leadership of Elton Herbert in the Bioenvironmental Bee Laboratory) developed a unique diet of pollen substitutes and sugar syrup to ensure maximum populations of honey bees for honey production and pollination. This nutritionally-balanced diet was designated as the "Beltsville Bee Diet" and licensed to a commercial firm (Bio-Serv of Frenchtown, NJ) for production and marketing.

Bio-Serv now uses some of the profits from the sale of the Beltsville Bee Diet to support graduate students in apiculture. In past years, the Graduate Student Award has consisted of a plaque and a check for \$100. This year, the award was increased to \$500 and may increase even more in coming years.

This is an excellent example where the spin-off from the research dollar is helping the agricultural industry and also aiding the development of promising future research scientists. The award is presented each year at the annual meeting of the Eastern Apicultural Society.

Research Apprentice Wins Scholarship

Sherita A. Hill, one of 26 summer Research Apprentices at Beltsville, is the winner of a top award from the Office of the Chief of Naval Research. Ms. Hill, who did a study on the effects of air pollutants on crop plants, received a \$3,000 scholarship for excellence in the life sciences. Her research project was conducted under the guidance of Edward H. Lee and other scientists in the Plant Stress Laboratory, PPHI.

Ms. Hill graduated from Eleanor Roosevelt High School in May and plans to enroll at the University of Maryland this fall. She will major in biology.

Closing exercises for the Summer 1986 Research Apprentice Program for High School Students were held at the University of Maryland on August 15. Margaret Johnson, EEO Manager, Beltsville Area, and Amel A. Anderson, Assistant Dean, University of Maryland, coordinated the summer program for 39 students at Beltsville, College Park, and Frederick, Maryland.

Visiting Scientist Anusa Wijesekara, Central Agricultural Research Institute, Sri Lanka, will be studying insect taxonomy during the coming year with Eric Grissell and Mike Schauff (Systematic Entomology Laboratory, BBII), Bill Rowe (Smithsonian Institution), and Charles Mitter (University of Maryland). His specific interest will be on the systematics of eulopid wasps that parasitize moth larvae.

Mr. Wijesekara is enrolled as a special student at the University of Maryland but will spend the majority of his time studying insect specimens in the wasp collection at the Smithsonian's Natural History Museum. His research will be directed primarily by Dr. Schauff.

Budget Outlook The Federal Budget is continuing to incur a significant deficit. Because of this problem, the House Appropriations Committee has recommended that Gramm-Rudman-Hollings deficit reductions for FY 1986 not be restored for FY 1987. With this likelihood in mind, it will be necessary for us to exercise considerable restraint as we plan for FY 87.

Accordingly, a number of steps will be taken to constrain expenditures in the Beltsville Area. Recruitment of permanent personnel positions will be curtailed except under the most pressing circumstances. The Greenhouse Committee will review the use of greenhouse space to determine if some consolidations can be made and certain sections mothballed. We have an ongoing program to conserve utility costs through an energy retrofit and maintenance plan. We are also evaluating our inhouse and contractual support services to reduce costs.

Our ability to carry forward the Agency's program depends upon each of us making the most efficient and effective use possible of our scarce resources. Your ideas and suggestions are welcome.

Cash Awards Jacqueline S. Baker, Biological Laboratory Technician, Helminthic Diseases Laboratory, API - For superior service in the maintenance and management of laboratory resources and tissue culture facilities.

Mary L. VonVleck, Biological Laboratory Technician, Nonruminant Animal Nutrition Laboratory, ASI - Efficiently analyzing liver tissue in swine and poultry for metabolic and enzyme activities and for organizing results.

Thomas C. Hyland, Sheet Metal Mechanic, Sheet Metal Shop, DO - Mr. Hyland has performed his duties in an outstanding manner for the past 15 months. During that period he has been a very valuable employee of the Sheet Metal Shop, Maintenance and Construction Branch.

Rennie J. Stavely and Con Jacyn Baker, Research Plant Pathologists, Microbiology & Plant Pathology Laboratory, PPI - Invention award for issuance of U.S. Patent 4,582,704 - Title: Control of bean rust with Bacillus subtilis.

Hyun S. Lillehoj, Microbiologist, Protozoan Diseases Laboratory, API - For research that has led to a more comprehensive understanding of the mechanisms by which coccidia induces immunity in the host.

P. A.ENZIAN, Tractor Operator, Farm Management Branch, DO - Outstanding performance of assigned duties in the Research Plots Section of the Farm Management Branch.

Helen N. Proctor, Clerk-Typist, Systematic Entomology Laboratory, BBII - For exemplary, sustained achievement in performing clerical duties as a competent and dedicated member of the Systematic Entomology Laboratory.

Barry M. Chute, Microbiologist, Protozoan Diseases Laboratory, API - For facilitating the automation of the administrative and technical functions of the laboratory in a manner that increased productivity at a substantial savings.

Robert B. Ewing, Illustrator, Biosystematic Parasitology Laboratory, API - For sustained high level production of scientific illustrations of superior quality.

Jeanne R. Morrisette, Hydrologic Technician, Hydrology Laboratory, ASRI - For outstanding performance in coordinating model implementation and simulations in a time of increased modeling activity and in coordination and supervising the 1040 program during a period of major turnover.

Sharon Kenworthy, Geneticist, Germplasm Introduction and Evaluation Laboratory, PGGI - For excellence, dedication, and sustained effort in handling various responsibilities of the Plant Introduction Office.

Shirley L. Cress, Secretary, Vitamin and Mineral Nutrition Laboratory, BHNRC - In recognition of her sustained superior performance and acceptance of increased duties and responsibilities while the laboratory was in a transition of rapid expansion during the last 36 months.

Quality Increase

Maureen T. Pello, Biological Laboratory Technician, Ruminant Nutrition Laboratory, ASI - For continued excellence in performance of duties and superior initiative contributing to the success of innovative research.

Ethel H. Hackett, Public Maintenance Clerk-Typist, Systematic Botany, Mycology, and Nematology Laboratory, BBII - In recognition of sustained superior performance in obtaining, organizing and maintaining the books, reprints, journals, and miscellaneous literature in the Stevenson Reference Room; in recognition of performance of duties beyond her job description in an unusual, emergency situation; and finally, in recognition of her cheerful and cooperative attitude in assisting laboratory personnel in locating literature and procuring necessary supplies and equipment.

Virginia C. Burnett, Biological Laboratory Technician, Microbiology and Plant Pathology Laboratory, PPI - For exceptional devotion to high quality productive research support with outstanding skill, reliance, and loyalty.

Margaret D. Brannigan, Plant Pathologist, Florist and Nursery Crops Laboratory, HSI - In recognition of outstanding support of research on the cytology of pathogenesis of the citrus canker bacterium.

Epilogue

Every man's work, whether it be literature or music or pictures or architecture or anything else, is always a portrait of himself.

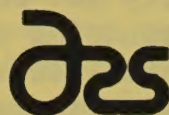
-----Samuel Butler (1835-1902)

Waldemar Klassen

WALDEMAR KLASSEN
Director
Beltsville Area

Notes

From the
Director



Agricultural
Research
Service

United States
Department of
Agriculture

Beltsville, Maryland

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October 1986

The State of the
Beltsville Area

On October 8, the Area Office principals met with Dr. Kinney and key leaders of the Administrator's Staff to report on the state of the Beltsville Area. I would like to share with you some of the important issues which we have addressed during the past fiscal year and some of the challenges which lie ahead as we enter FY 1987.

We are proud of the progress you have made over the past year. Many important research contributions have been reported, and we have highlighted some of them in these newsnotes over the past 12 months. We also have compiled a list of "Examples of Progress for FY 1986" which is available from the Area Office upon request.

We have made a major effort over the past year to deal with the financial constraints confronting our scientists and to improve the fiscal viability of various management units. On the whole, the research management units are more viable than they were a year ago. Indeed, 42 of the 51 research management units have more than \$20,000 of discretionary funding per scientist, with the average for the Beltsville Area being \$32,000. This has been achieved by consolidation of laboratories and by abolishment of selected vacancies. Through these actions, about \$3.5 million of resources have been made available to the remaining scientists. In addition, the U.S. National Arboretum received a budget increase of \$450,000 (net to location). Budget increases were also received for the Beltsville Human Nutrition Research Center, the Remote Sensing Laboratory, the Hydrology Laboratory, the Model and Database Coordination Laboratory, and the Pesticide Degradation Laboratory.

Progress was made in improving our facilities. A new gene transfer building for livestock research and a small animal facility for animal parasitology were completed during FY 1986. We renovated a laboratory complex for plant pathology research in Range 2 and replaced the roof on the Bioscience Building. With funds from Dr. Kinney's National Facilities Management Program and the Area Repair and Maintenance Fund, we are undertaking a major renovation of Building 006 in FY 1987 for research on plant molecular genetics. The building has been vacated, and the job is to be completed within 12 months.

Two areas of human nutrition research were strengthened substantially. The first area, obesity and energy metabolism, was strengthened by constructing the only human calorimetry facility in North America and by placing Paul Moe, who has extensive experience in the field of calorimetry and energy metabolism, in charge of this new thrust. The second area, effects of sugar and copper consumption patterns on heart disease, was strengthened by forming a team of animal physiologists and human nutritionists. This team has developed the use of swine as a model to investigate the deleterious effects of copper deficiency and the exacerbation of these effects by certain sugars such as fructose.

"Renaissance 93," a plan to restore and upgrade facilities and programs, was developed. The highest priorities in this plan are to assure the viability of the physical plant and provide for state-of-the-art facilities and scientific equipment. This plan has been helpful in guiding the use of the "4% R&M" funds and also in preparing the Area's High Priority Requirements List.

Indirect research costs continue to receive a great deal of attention. The FY 1987 budget for Animal Operations has been cut by more than 10 percent. Thirteen positions were eliminated in the Division of Operations. A special team involving the National Program Staff, Administrative Management, and Personnel Management is examining indirect research costs as they apply to livestock and poultry research. In addition, the A-76 Cost Comparison effort is underway both at BARC and at the Arboretum. This process should highlight additional efficiencies for implementation during FY 1988.

Beltsville Scientists in Leadership Roles

The opportunity to assume the top leadership position in a national professional society is an honor that comes to only a select few. A number of ARS scientists at Beltsville are poised to assume national leadership positions in their professional scientific societies over the next few years.

K. D. Murrell, Research Leader, Helminthic Diseases Laboratory, API, has been elected President of the American Association of Veterinary Parasitologists. This professional organization is affiliated with the American Veterinary Medical Association and provides a strong voice for researchers, teachers, and practitioners working in the field of veterinary parasitology. The AAVP has given very strong visibility to the research programs in the Animal Parasitology Institute.

The Plant Growth Regulators Society of America has elected George L. Steffens to its Presidency for the coming year. Dr. Steffens is a Research Plant Physiologist in the Fruit Laboratory, HSI, and has been an active member of the Society since its inception.

Helene Cecil, Research Physiologist, Avian Physiology Laboratory, ASI, was elected First Vice President of the Poultry Science Association during the annual meeting at Raleigh, NC, in August 1986. The First Vice President traditionally is elected to the Presidency of the Association upon the expiration of the term of the incumbent President. Dr. Cecil thus is poised to assume the top leadership position of this 2,000 member professional association.

We are proud to acknowledge the outstanding contributions being made by our esteemed colleagues on the national scene.

Introduction of Recombinant Genes Into Farm Animals

The technology for introducing recombinant genes into laboratory animals has been available only since 1980. Gene transfer into farm animals is required to evaluate its potential for improving production efficiency and disease resistance of livestock. Scientists in the Animal Science Institute have been collaborating with colleagues at the University of Pennsylvania and the University of Washington to demonstrate that foreign genes can be transferred into farm animals and that these animals in turn will transmit the gene to their offspring.

In a recent paper, the Beltsville scientists and their collaborators provide details on the transfer of the bovine growth hormone gene into nuclei of recently fertilized pig and sheep eggs. Animals that contain copies of the injected gene in their chromosomes are "transgenic." Transgenic pigs and sheep have been produced by the microinjection of single-cell zygotes and two-cell ova with linear molecules of mouse metallothionein I promoter/regulator fused to bovine growth hormone structural genes. Three transgenic lambs and 31 transgenic pigs were born, of which two lambs and 19 pigs produced the foreign growth hormone. Growth rates have not been higher in transgenic than control animals, but transgenic pigs have much lower backfat measurements than control pigs. Five transgenic pigs transmitted the foreign gene to one or more offsprings. The experiments demonstrate that foreign genes can be transferred into farm animals and that many transgenic animals can transmit the gene. When genes of economic importance are isolated and cloned, their transfer into livestock are expected to have practical value to agriculture.

Publication on
Lipids Attracts
Industry Interest

Wyeth Laboratories of Philadelphia, Pennsylvania, has requested permission to reprint and distribute over 30,000 copies of a publication by Joel Bitman, who recently retired from the Milk Secretion and Mastitis Laboratory, ASI. The research paper, "Comparison of the lipid composition of breast milk from mothers of term and preterm infants," appeared in The American Journal of Clinical Nutrition in 1983. Dr. Bitman is widely known for his contributions to the field of biochemistry and especially for his research on lipid metabolism and the effect of growth hormone on milk yield and composition.

Microinjection of
Chromosomes Into
Single Cells of
Crop Plants

Current genetic engineering technology will allow two different types of gene transfer. The first type involves cell fusion and the transfer of all the genes from a donor species. The second type of transfer involves the use of vectors to deliver a single gene into a host cell. In a recent paper, Robert Griesbach, Florist and Nursery Crops Laboratory, HSI, describes a new method which allows the transfer of more than one gene but less than the whole complement of genes on a chromosome.

Chromosomes were isolated from a drought tolerant species (Petunia alpicola) and microinjected into protoplasts of the cultivated petunia (Petunia hybrida). The injected cells were then screened for the expression of foreign proteins on polyacrylamide gels. Several cells were identified which produced stable differences in protein profile. These cells are currently being regenerated into whole plants. This technique could allow the plant breeder to bridge the gap between wide hybridization and DNA transformation where single genes are transferred. Chromosome mediated transformation will allow the transfer of polygenic characteristics between sexually incompatible species.

Germplasm Resistant
to Barley Leaf
Rust

Leaf rust reduces the production and quality of barley in most areas where it is grown. The most effective method for reducing the losses from the disease is the growing of resistant barley cultivars. Resistant cultivars are available, but they all have the same gene or genes conferring their resistance. Few sources of resistance to the pathogen causing this disease are available.

John Moseman, recently retired from the Germplasm Quality and Enhancement Laboratory, PGGI, has spent a professional career dedicated to improving the basic germplasm necessary for a viable U.S. barley industry. He has collaborated with colleagues around the world, focusing especially upon vital sources in Ethiopia, Egypt, and Israel. Dr. Moseman recently reported on the

evaluation of 244 Ethiopian spring barley accessions. He has also prepared a recent publication on sites in Israel where plants of Hordeum spontaneum, a parent of cultivated barley, are resistant to the leaf rust pathogen. Forty H. spontaneum accessions were identified that were resistant to both the leaf rust and powdery mildew pathogens. Seed of 292 accessions studied has been increased and added to the National Small Grain Collection at Beltsville where it will be available to barley breeders. More than 100 accessions resistant to the leaf rust pathogen have been crossed with genetic male sterile cultivars to develop a composite cross-population. That population will be used to conserve and recombine the resistance genes and to develop parents for breeding new productive barley cultivars with stable resistance to leaf rust. Those cultivars will reduce the losses from the disease in the United States and worldwide.

Biocontrol of Verticillium Wilt in Crops

Verticillium wilt is a serious disease of many crop plants. The disease is caused by Verticillium dahliae, a fungus that lives in the soil. Previous work has shown that another indigenous soil fungus, Talaromyces flavus, can control Verticillium wilt of eggplant and potatoes. Since T. flavus is known to produce antibiotics, a team of scientists in the Soilborne Diseases Laboratory, PPI, conducted studies to determine whether antibiotic production might be involved in the mechanism of control of Verticillium by Talaromyces. The ARS team, consisting of D. R. Fravel, K. K. Kim, and G. C. Papavizas, recently found that T. flavus does produce a metabolite which can kill microsclerotia, the resting structures of Verticillium, and retard its growth. These studies are significant because identification of the Talaromyces metabolite, which is apparently different from the other four metabolites produced by this biocontrol agent, will assist in understanding the precise mechanism of biocontrol of Verticillium wilt thus improving the prospects for practical control.

Controlled-Release Baits for Mediterranean Fruit Flies

The Mediterranean fruit fly, Ceratitidis capitata Wiedemann, is a major agricultural pest in many areas of the world. Trimedlure (TML), the synthetic attractant of the Mediterranean fruit fly (medfly), may be used as bait in detection traps. Southern U.S. border states, such as Florida and California, continuously monitor an extensive array of trimedlure-baited traps to detect the presence of accidentally imported medflies. However, the standard dose of TML evaporates from the cotton dispenser in 2-4 weeks and the wicks must be replenished frequently. Because of the high cost to rebait the traps and the danger of site contamination with spilled TML, the development of a solid, controlled-release dispenser could substantially increase the efficiency of detection programs.

Barbara Leonhardt and Terrence McGovern, Insect Chemical Ecology Laboratory, AEQI, have collaborated with ARS scientists in California and Hawaii and with university colleagues at California and Maryland to evaluate a variety of commercial controlled-release formulations. A series of both laboratory and field experiments were carried out. The biological activity of field-aged dispensers was measured in Hilo, HI, by insect capture in a population of released, lab-reared flies.

The most effective dispenser, a solid polymeric plug containing 70% by weight TML, gave insect captures for 8-12 weeks which were not significantly different from those with the reference, freshly treated, cotton wick. Federal and state action agencies have agreed to adopt the new dispensers and are in the process of procuring the improved, controlled-release, solid dispenser for use in monitoring programs.

**Comprehensive New
Publication on
Ladybird Beetles**

Ladybird beetles or "ladybugs" feed on serious agricultural pests such as aphids, scale insects, and plant feeding mites. Many species of these natural enemies have been introduced into the U.S. as biological control agents and are responsible for major economic savings. It has been difficult or impossible for biological control experts to identify most of the ladybird beetles important in their pest management systems, and this situation has hampered effective use of these beetles as biological control agents.

Robert Gordon, Research Entomologist, Systematic Entomology Laboratory, BBII, has developed a comprehensive, systematic manual on the ladybird beetles of America north of Mexico. This new publication will greatly facilitate identification and will give needed information on hosts and distribution. A summary of data on species that have been introduced into the U.S. in the past also is included. This research is of major importance in increasing the usefulness of ladybird beetles as biological control agents in U.S. agriculture.

**Image Analysis
Instrumentation
Now Available**

The Systematic Entomology Laboratory, BBII, has purchased an image analysis system and installed it in Building 177-B, BARC-East. This new instrumentation is being used within SEL for Africanized bee identifications. Also, it can be made available to other ARS scientists. SEL scientists have been pleased with the results obtained from this instrument and look forward to its use for other applications.

If you wish to explore the use of this instrumentation for your research, contact Douglass R. Miller, Research Leader, SEL, 344-3183. If you need information on the instrument capabilities, call Chris Pooley on 344-2046.

Changing Spending Patterns for Child Care

Frankie Schwenk, Research Economist, Family Economics Research Group, recently completed a study of child care arrangements and expenditures. The need for child care accommodations is growing. Not only has the number of American children under 5 years old increased since 1980--from 16.4 million in 1980 to 17.8 million in 1984--but, also, more mothers are working and there are more single-parent families. The labor force participation rates of married mothers rose from 40 percent in 1970 to 59 percent in 1984, whereas, the rate for divorced mothers increased from 76 percent to 79 percent. These factors contribute to an increased demand for child care arrangements.

Families with preschool children may spend as much on child care as they spend on clothing or health care. One-half of all two-parent, two-earner families with a preschooler incurred child care expenses averaging 6 percent of their total expenditures. Working single parents devoted 10 percent of their spending to child care, reflecting both higher child care costs and lower incomes of single parents. With labor force participation rates of married mothers with children under 6 years increasing at a rapid rate, the demand for and expenses associated with child care are likely to grow. This information, along with other research on the changing spending patterns of families, is being compiled for the Joint Economic Committee of Congress for a new report on the economic status and choices of American families.

Women's Equality Day Awards

I am pleased to report that four employees at Beltsville were recognized in August for their personal achievements and for advancing equal opportunity for women in the work force.

The first Federal Women's Program (FWP) Awards Luncheon was held at the Golden Bull Restaurant on August 26. Two employees were cited by Dr. Kinney on this occasion for their noteworthy contributions. Phyllis A. W. Martin, Research Microbiologist, Insect Pathology Laboratory, PPI, was presented the 1986 FWP Impact Award for her special contributions toward enhancing employment opportunities for women. Dr. Martin has a key leadership role in "Women in Science," a discussion group which has promoted communications and networking among the scientists at Beltsville.

In the same ceremony, Viola Matthews, Clerk-typist in the Insect Chemical Ecology Laboratory, AEQI, was cited as the Clerical Employee of the Year for 1986. Ms. Matthews has made outstanding contributions to the productivity of the laboratory's programs. The two foregoing awards were initiated by the Beltsville Area EEO Advisory Committee.

On the same day, Peter Myers, Deputy Secretary of Agriculture, gave awards to two other Beltsville employees. Vallie Bray, FWP Coordinator for the Beltsville Area and a member of the Insect Pathology Laboratory, PPI, and George Papavizas, Research Leader, Soilborne Diseases Laboratory, PPI, were selected by the USDA Women's Action Task Force to receive awards for promoting equality for women. These two awards were presented in Deputy Secretary Myers' office.

I extend my sincerest appreciation to these four employees for their spirit of support and commitment to EEO and public service.

Plant Nutritionists Gather

The Beltsville Agricultural Research Center, in cooperation with the University of Maryland, hosted the Tenth International Plant Nutrition Colloquium, August 4-9, 1986. Over 245 scientists from 28 countries attended the meeting and exchanged ideas on the most recent developments in the field of plant nutrition. Scientists from Beltsville, including E. Anderson and R. Chaney (AEQI), A. Fleming and C. Foy (PPHI), M. Faust and R. Korcak (HSI), and C. Shear and A. Taylor (retired, ARS), played a lead role in organizing the meeting.

Advance Approval of Training

Training is an important avenue for enhancing employee performance and improving productivity. Training should be carefully planned, and evaluations should be made annually to determine the training needs of each employee. The primary responsibility for planning, requesting, and participating in training lies with each employee and the employee's supervisor.

All training to be paid for by the Government must be approved in advance. Occasionally, employees enroll in a course and then ask for approval. Requests for retroactive approval will not be considered. It is important for each employee to understand that he or she should not enroll in a training course with the hope that post-approval will be obtained for reimbursement at a later date. Remember: Training must be approved in advance of enrollment.

Cash Awards

Bruce W. Kennedy, Biological Laboratory Technician, Carbohydrate Nutrition Laboratory, BHNRC - In appreciation of hard work and dedication in modernizing the Animal Care Facility of the Carbohydrate Nutrition Laboratory and for conducting courses to train the Animal Care Personnel of BARC for certification by the American Association for Laboratory Animal Science.

Mary A. Brocker, Secretary, Institute Office, API - For continued outstanding performance in managing and administering the office for the Animal Parasitology Institute resulting in a high level of efficiency and productivity.

Richard T. Brown, Physical Science Technician, Analytical Chemistry Laboratory, AEQI - For sustained and superior performance in the use of gas-liquid chromatography techniques for the separation of pesticide products.

Gloria V. Gantt, Laboratory Worker, Insect Chemical Ecology Laboratory, AEQI - For special and responsible service in providing support for the research program of the Insect Chemical Ecology Laboratory, particularly during August and September 1985.

Robert D. Lumaden, Research Plant Pathologist, Soilborne Diseases Laboratory, PPI - Invention Award for issuance of U.S. Patent No. 4,588,584, "Medium for the isolation of Pseudomonas cepacia biotype from soil and the isolated biotype."

Evelina Wolley, Kenneth Goodson, Irene Franklin, and Betty Perkins, Laboratory Workers, Laboratory Services, API - For exceptional initiative and effort in providing needed service while saving funds for the Animal Parasitology Institute.

George F. Shaffer, Jr., Animal Caretaker Foreman, API - For sustained and dedicated service in the efficient management and excellent care of experimental animals.

Shannon Lawrence, Accounting Technician, PPHI - For establishment and operation of a rational and useful accounting system for use by the laboratories of the Plant Physiology Institute.

John D. Pomarzynski, Electrician, Maintenance & Construction Branch, DO - Outstanding work performance in the Electric & Line Maintenance Shop of the Maintenance & Construction Branch, Division of Operations.

Janice R. Wright, Dairy Scientist, Animal Improvement Programs Laboratory, ASI - For sustained superior performance as a dairy scientist at AIPL in assisting with research projects and for streamlining and documenting type evaluation procedures.

Andrea Powell, Nutritionist, Carbohydrate Nutrition Laboratory, BHNRC - In recognition of service above and beyond the normal duties of a nutritionist in overcoming many problems inherent in programming of the laboratory PC to permit completion of the FY 87 budget on time during a period when the lab had no permanent secretarial/clerical help.

Sandra M. Clevenger, Secretary, Horticultural Crops Quality Laboratory, HSI - For outstanding performance in the coordination, organization, and typing of the voluminous USDA Agricultural Handbook 66 in addition to the superior performance as the laboratory secretary.

Susan M. Thompson, Microbiologist, Microbiology and Plant Pathology Laboratory, PPI - For valuable and sustained contributions to the application of recombinant DNA techniques to plant viroid research.

Dwight E. Lynn, Research Entomologist, Insect Pathology Laboratory, PPI - For outstanding contributions to the efficient operation of the Insect Pathology Laboratory through the generous use of his time and talents to instruct and assist the staff in applying word processors and personal computers to their research or administrative duties, while maintaining his own productive research program.

Theodore W. Little, Foreman, Paint Shop, DO - In performing his duties as Foreman of the Paint Shop, Mr. Little has far exceeded the normal requirements of the position. Mr. Little's shop is responsible for painting and shading work here at BARC.

Barbara Howdershell, Clerk-typist, Insect Reproduction Laboratory, AEQI - For efforts beyond the call of duty in providing essential services to the Insect Reproduction Laboratory during a critical 3-month period.

Terrence P. McGovern, Research Chemist, Insect Chemical Ecology Laboratory, AEQI - Invention Award for issuance of U.S. Patent 4,530,935 - Title: Insect repellents.

Quality Increase

Jane W. Fleming, Clerk-typist, Reproduction Laboratory, ASI - For outstanding performance of duties as Clerk-typist of the Reproduction Laboratory.

Douglas W. Caldwell, Biological Laboratory Technician, Reproduction Laboratory, ASI - For developing radioimmunoassay and high performance liquid chromatographic procedures to quantify prostaglandins and related compounds of the arachidonic acid cascade.

Viola C. Matthews, Clerk-typist, Insect Chemical Ecology Laboratory, AEQI - For excellent performance and conscientiousness in providing clerical support for the scientists in the Insect Chemical Ecology Laboratory.

Theresa I. Goldman, Biological Laboratory Technician, Ruminant Nutrition Laboratory, ASI - In recognition of continuous performance of duties in research on the growth rate of heifers at a high level of quality and productivity while creating very positive interactions with all coworkers and professionals.

Patricia A. Wells, Microbiologist, Energy & Protein Nutrition Laboratory, BHNRC - For sustained excellence in the performance of her responsibilities at an exceptionally high level with reliance, skill, dedication, and loyalty.

Charles A. Murphy, Biological Laboratory Technician, Germplasm Quality & Enhancement Laboratory, PGGI - For continued high performance in laboratory, field, and greenhouse experiments.

Norma Peters, Clerk-typist, Institute Office, API - For outstanding administrative support in the Office of the Director.

Epilogue

Rating the relative importance and/or urgency of programs can have a negative effect on the organization's esprit de corps, but making the tough choices without destroying morale is what management is all about.

----- George W. Irving, Jr.

Waldemar Klassen

WALDEMAR KLASSEN
Director
Beltsville Area

